6.0 BUILDING ASSESSMENT

6.1 Building Mechanical Utilities Study

As indicated by the existing building documents and site observations, the mechanical systems are served by outside utility services for plumbing, fire protection, and heating, ventilating, and air conditioning (HVAC) needs. These systems typically provide utility services entering or leaving the building.

Water: From the north City water line, two 6-inch underground potable water lines enter the building. One provides potable water for the plumbing systems, and the other provides water for the fire protection sprinkler system.

Sanitary Sewer: From the west half of the building, a 4-inch underground sanitary sewer line exits the building. From a more central location, a 6-inch underground sanitary sewer line exits the building. Flow from both lines is to the north.

Acid Waste Sewer: A 4-inch or 6-inch acid waste sewer line exits the building to the north. Flow enters an acid dilution basin, and then piping discharges flow to the sanitary sewer.

Storm Sewer: For most of interior roof storm water drainage, an underground 15-inch storm sewer line exits the building to the north. Mostly for storm water drainage from the Parking Ramp, an 8-inch line also exits to the north. Since original construction, the underground storm sewer system was separated from the sanitary sewer system.

Chilled Water: From the Capitol Complex Central Plant, 8-inch chilled water supply and return services are piped through an underground tunnel. To meet rated design cooling capacity, air handling unit (AHU) cooling coils require 46°F chilled water. At times, the central plant chilled water production and distribution system has not provided adequate chilled water flow and / or temperature.

Further study, not part of this project, is recommended to clearly identify chilled water production problems, analyze options, and provide recommendations for future upgrades.

Steam: From the Capitol Complex Central Plant, 6-inch high-pressure steam supply and 4-inch steam condensate return services are piped through an underground tunnel.

Natural Gas: A 3-inch natural gas service enters from the north. Natural gas is provided to a summer hot water boiler, water heaters, and lab services.

6.1.1 Plumbing Systems Review

Based on visual inspection and meeting with the maintenance staff, the plumbing systems appear to be in good operating condition. Some problems have been reported that include:

1. For potable cold and hot water piping distribution, the number of shutoff isolation valves is deficient.

2. Some apparent leakage problems exist above 2nd Level West.

3. Sweating on some cold water piping has been a problem. Insulation may need to be added.

4. Where in direct contact with concrete floor, some horizontal cast iron sanitary sewer piping has corroded and leaked. Portions have been replaced. Major renovations have helped to alleviate this issue, although this condition could still exist in unidentified areas. This has not appeared to be problem in any of the vertical sewer piping stacks.

6.1.2 Fire Protection Systems Review

Based on visual inspection and a meeting with the maintenance staff, the fire protection sprinkler system appears to be in good operating condition. Some problems have been reported that include:

1. The number of tamperproof system shutoff valves is deficient. When only minor sprinkler head remodeling or changes are required, large parts of the system must be drained and then refilled.

6.1.3 HVAC Systems Review

Based on visual inspection and meeting with the maintenance staff, the HVAC systems appear to be in good operating condition for equipment this old. The equipment does not, however, meet the needs of the building. Some significant problems have been reported that include:

1. Original AHUs unable to provide more than 60-70% of design airflow. At 100% design conditions, supply and return duct airflow velocities and air pressure

drops are excessive. This has caused excessive sound in the occupied spaces, and decreased the comfort in the office area. Also, cooling coil face velocity can reach 600 feet per minute, causing poor summer dehumidification.

2. Due to reported deficiencies in AHU-1 system performance, a packaged Trane rooftop unit (RU-1) was added for 2nd Level DCI lab areas, and AHU-9 was added to serve the Metrology Lab space.

3. Summer space temperatures and humidity have been generally too high. Although not witnessed, summer outside air and space dehumidification has been reported to be very poor.

4. There is very poor access (inaccessible or exact location unknown) to secondary hot water heating pumps, piping, and control valves. This occurs on all five levels. Operating condition of equipment has not been verified.

5. There is poor air distribution in many areas. Many occupants use small circulating fans and small electric heaters in summer and winter.

6. Recirculation of exhaust airflow into the outside air intake of some AHUs has been documented and observed. This can reduce the indoor air quality for the occupants.

7. Particularly in the Atrium large glass areas, significant winter cold downdrafts have been reported. Perimeter fin tube, hot water heating coverage is only partial.

8. Wide variation in temperatures between north and south areas. Space temperature ranges of 66-80°F have been documented. Occupants sitting directly under some supply air diffusers have experienced an even wider range of temperatures.

6.2 Facility Management Control Systems (FMCS) review

Based on visual inspection and meeting with the maintenance staff, FMCS appears to be in good operating condition. Many controls have been upgraded and are compatible with the current Siemens FMCS for the Capitol complex. Some problems have been reported that include:

1. Some original pneumatic control components remain. Their operating condition has not been verified.

6.3 Testing and Balancing Report

Existing Testing and Balancing (TAB) reports from the original construction or from more recent years were not found.

For seven of the ten larger air handling units, airflow measurements were taken during the week of November 8 for the office areas on levels one through five. For five of the office area AHUs, peak airflow measured averaged 63.4% of the original design intent. For the lab spaces on the first level, one AHU was operating at 37.9% and the other was at 60.3% of the original peak cfm design intent.

Chilled water flow measurements were not possible at this time. The chilled water cooling system had been drained for the season.

Hot water flow measurements at each floor level were not possible at this time. The secondary hot water heating pumps are not accessible.

6.4 Electrical Systems Review

The primary electrical power into this facility is provided by two (2) 1000 KVA transformers. These transformers are each loaded to approximately half of their full capacity, and have room for expansion and additional loading. In order to be able to use the available transformer capacity, however, the excessive heat in the electrical room must be addressed. Currently, the electrical room temperature, now about 120 degrees F, is too hot to allow full utilization of the transformers.

Internal building electrical distribution is currently near capacity, and expansion of existing office space requires additional feeds and associated circuit breaker panels.

6.5 Communications Systems Review

The communications system was reviewed and it was determined that the system is acceptable as found, however there is a lack of fiber optic cable in the building, and this could limit further high-speed computer networking.

The fire detection and alarm system presently appears to be in working condition, however, it is obsolete, performing at capacity, and requires continuing maintenance.

6.6 Building Accessibility Review

6.6.1 Restroom Requirements

Wallace Building restroom fixture review, per the State of Iowa Building Code, Chapter 16, 661—16.401 (104B):

Water Closets	Urinals	Lavatories	Comments
1st floor			
10	2	12	Existing
7		4	Required
10 *	2 *	10 *	Proposed
			* including accessible fixtures
2nd floor			
14	3	16	Existing
7		4	Required
17 **	4 **	18 **	Proposed
			** including accessible fixtures in main restroom and new fixtures in proposed auditorium restroom area as per A-1 requirements
3rd floor			
7	2	8	Existing
5		3	Required
7 *	2 *	6 *	Proposed
			* including accessible fixtures
4th floor			
7	2	8	Existing
5		3	Required
7 *	2 *	6 *	Proposed
			* including accessible fixtures
5th floor			
7	2	8	Existing
5		3	Required
7 *	2 *	6 *	Proposed
			* including accessible fixtures

6.6.2 Stairwells

The existing Wallace Building stairwells have approximately 7” risers and 10” treads. Per the Department of Public Safety, Building Code division, the existing stair design can remain in place. Additional smoke detectors and other fire safety upgrades should be provided in lieu of extensive stair remodelling or complete reconstruction. New handrail designs, to meet current code, should be provided.

6.6.3 Elevators

The elevators do not operate correctly, and do not meet current accessibility requirements. Elevator service needs improvement.

6.7 Code Review

6.7.1 Civil / Structural / Architectural Code Issues

The State of Iowa Building Code and 1994 Uniform Building Code (UBC) were referenced for review; however, the 2000 edition of the International Building Code (IBC) was also reviewed for current standards.

Accessibility into the building, within the building, and to and within restrooms was reviewed for compliance with the State of Iowa Building Code (661 Iowa Administrative Codes, Chapter 16).

The architectural short-term repairs and modifications will not bring the building into compliance with current codes. Items still out of code compliance include (but are not limited to):

1. Access of personnel and visitors from the parking structure across Pennsylvania Avenue.

2. Non-compliant elevators, controls (elevator operation also needs improvement).

3. Restroom accessibility.

4. Accessible door hardware.

5. There are structural problems with existing beams, retaining walls, and double tees of the Wallace Building Parking Ramp. This system can no longer support the loads it was intended to carry. The most severely cracked and deflected ramp beams will be shored, but the double tees are still deficient. Parking on the upper level has been restricted.

Accessibility issues / upgrades to be performed on a case-by-base basis. The ADA Advisory Committee should be consulted on these issues.

6.7.2 Mechanical Systems Code Issues

The State of Iowa Building Code, which references the 1994 Uniform Mechanical Code (UMC), was referenced for code review; however, the International Mechanical Code (IMC) was referenced for more current standards for the long-term evaluation and remodel. More recent ASHRAE energy guidelines were also referenced.

Based on the existing construction, occupancy, and use of space, specific Iowa building code deficiencies have not been reported at this time. With the relocation of the first and second floor labs to other sites and as the space utilization changes, some upgrades to comply with more recent codes will be desirable or required. When significant changes occur, a meeting with the Fire Marshall is recommended.

1. Plumbing

    a. Depending on the number of occupants, the number of water closets, urinals, and lavatories will change on each floor.

    b. To comply with accessibility guidelines, appropriate plumbing fixtures with adequate space are required.

    c. To comply with the National Electrical Code, drain pans need to be installed under piping in the electrical room, and / or several pipes must be re-routed so as not to cross over electrical switchgear.

2. Fire Protection

    a. No specific code deficiencies have been reported at this time.

    b. To facilitate proper and efficient sprinkler system remodeling, additional tamperproof shutoff valves may need to be added.

3. HVAC

    a. For proper operation of the existing natural gas heating boiler; the boiler room general construction, combustion air source, and flue venting system should be reviewed with the Fire Marshall. Some improvements are recommended and required.

    b. Testing and Balancing (TAB) should be performed to insure that code required exhaust ventilation, particularly for restrooms, is adequate.

    c. TAB should be performed to insure that code minimum required outside air ventilation is being maintained during occupied hours.

6.7.3 Electrical Systems Code Issues

The 1975 National Electrical Code (NEC) allowed that one exit from the electrical room was sufficient. In the 1978 NEC revisions, however, this was changed to two exits, and the issue is a life safety concern. The 1996 NEC was referenced for building review.

Electrical equipment and transformer locations do not meet the National Electric Code. There are unidentified circuits in circuit breaker panels throughout the building.

6.8 Pros and Cons of Building Replacement vs. Remodelling

Below is a qualitative table of pros and cons for total building replacement versus remodelling of the existing Wallace Building.

	Building Replacement on Complex		Major Building Remodel	
	Pro	**Con**	**Pro**	**Con**
Life cycle real estate value	√			√
Capital cost		√	√	
Building utilization	√		√	
Environmental impact		√	√	
Capitol Complex Master Plan compliance	√		√	
Aesthetic improvements	√		√	
Comfort and indoor air quality	√		√	
Energy efficiency	√		√	
Operation and maintenance	√		√	
Electrical, communications opportunities	√		√	
Proximity to Capitol building	√		√	
Risk		√	√	

6.9 Recommendations for Short-Term Building Work

The goals of the short-term recommendations are to improve the quality of building occupancy conditions for a two-year period. Due to the economics of the extensive remodelling needed to bring the building up to current codes, these items are not intended to be a long-term solution for the building issues.

This section presents an overview of the short-term building work scope found resulting from this study. For a detailed listing of these short-term building work scope items, see Section 01010, Summary of the Work, 2.0, Part 2 – Description of Short-Term Work, presented in Appendix B.

6.9.1 Parking Ramp

The existing upper parking deck is showing signs of overstress (overloading) and severe deterioration. To prevent any further deflection of primary beams, they should be shored – just to maintain their own weight, the weight of foot traffic, and that of snow loads, until the beams can be removed.

6.9.2 Utilities

The existing transformer and primary switchgear situation in the Electrical Room on first level does not meet code, and preventive maintenance on dry transformers is difficult. For these reasons, it is best to move the transformers and primary fused disconnects outside of the building. Moving this switchgear will require a planned power outage in other buildings. Careful planning will be required to minimize the impact on building occupants and the surrounding area.

6.9.3 Roof

The existing roof above the second level is at its warranty age. It should be monitored and repaired as required until replacement is possible.

6.9.4 Entrances

The existing Electrical Room does not have two exits as required by current code. Adding one exit to the exterior of the building roughly opposite the existing electrical room entrance is required under life safety recommendations.

6.9.5 Main Electrical Room Design

The Electrical Room is not constructed of adequate fire-rated wall or ceiling assemblies.

6.9.6 HVAC

The purpose of the following HVAC work is to insure that the existing mechanical equipment, components, and systems are performing in accordance with the original design intent.

The correct supply air diffusers should be used in all areas. If not, some occupants sit directly in the supply airstream. Depending on space cooling or heating requirements, these particular occupants will feel supply air temperatures changes from 55°F to 95°F. Review of diffuser and the change out of some is recommended.

As originally installed, some of the heating system equipment is not accessible for proper maintenance and testing. Improved access and relocation of some equipment is required to insure proper and peak performance.

Testing, adjusting and balancing (TAB) for all major HVAC equipment is recommended. This includes hot / chilled water pumps, air handling units, exhaust fans, VAV boxes, supply air diffusers, and return air grilles.

Some of this work applies toward the “Long-Term Work” solutions.

6.10 Recommendations for Long-Term Building Work

The goals for the long-term recommendations for the Wallace Building are to bring the building into code compliance, provide a long-term, serviceable office area, and to create a level playing field for the comparison of the building's long-term use versus demolition and replacement.

This section presents an overview of the long-term building work scope found resulting from this study. For a detailed listing of these long-term building work scope items, see Section 01010, Summary of the Work, 3.0, Part 3 – Description of Long-Term Work, presented in Appendix B.

6.10.1 Grounds And Landscaping

The Wallace Building design does not address today's safety concerns. Public access must be maintained, but some modifications should be made to restrict vehicle approaches to the main building entrance.

The existing reflecting pool will be removed and will not be replaced.

6.10.2 Wallace Parking Ramp

There are signs of severe deterioration to the topping slab covering the precast double tees. The precast double tees and the cast-in-place beams supporting them present a critical structural problem. Crack patterns within these members appear to be indicative of applied load(s) beyond the design limit. These flexural cracks, coupled with water intrusion from openings through the topping, are allowing the reinforcing steel to rust and expand, accelerating the deterioration of the structural elements. The structure is beyond repair and needs to be removed.

The slab-on-grade has settled and/or heaved in many areas. The sidewalk along the south side of the lower level has also shifted. These conditions present a hazard to pedestrian traffic. Within the parking slab some of the differential movement is beyond 2 ½ inches. The paving needs to be replaced.

Storm water drainage into and within the lower level is poor. The vehicle entrance off Des Moines needs to be modified to prevent street drainage out of the ramp and should be redesigned to provide better security.

6.10.3 Sidewalks And Parking

Since the new parking structure was built on the west side of Pennsylvania, across from the building, most personnel from the building park in this ramp. They approach the building from the intersection of Des Moines and Pennsylvania, crossing through shrubbery between the sidewalk along Pennsylvania and the dock area. They enter the building through the loading dock doors. The loading dock doors were not designed to serve as a primary entrance. For this and other reasons, additional entrances on the west side of the building are recommended.

6.10.4 Utilities

Mechanical and electrical utilities provide the necessary resources and energy for the operation of the building systems and comfort of the occupants.

6.10.5 Roof

Greenhouse Roof – This space was designed as a plant greenhouse. It has never met this function. The space is not wide enough to allow direct sunlight to reach plant tables. The space is cool or cold, depending on the season. The roof system, of a curtain wall type framing, leaks. The greenhouse roof needs to be replaced with a more conventional roof membrane assembly.

Main Roofs – The built-up roof above the fifth level has aged to the point of requiring replacement. The membrane roof above the second level (north and west side of the building) has reached the end of its design life. The entire roofing system needs replacement or excessive maintenance will be required.

6.10.6 Walls

The existing exterior walls are clad with a brick veneer. The brick consists of soft, coarse porous clay that has been wire cut and is finished with a baked-on white glaze. The brick units are oversized, 12" by 12" by 4" deep formed with four open vertical cores. The brick veneer is supported on steel relieving angles at 14-feet on-center vertically with the angles connected to the edge of the building perimeter slabs. Brick expansion joints are located at the building grids, 30-feet on-center along the walls square to the building and at 42-feet plus along diagonal walls.

The brick has expanded and crushed the joint filler within the expansion joints. Areas of mortar coursing have cracked, split or fallen out, providing openings for water and wind to enter the cavity behind the brick. The brick glazing has also lost most of its

waterproofing properties. Areas of brick absorb and/or hold water after any significant precipitation. This is visible on the exterior of the building and results in an unsightly appearance. On the interior of the building there have been complaints about water intrusion (some from areas of absorbed water, others from straight intrusion of water).

The exterior walls are insulated with two inches of rigid foamed insulation board (R-10) when placed behind masonry units on the interior. At areas to the inside finished with steel stud and gyp board the wall is insulated with a three-inch fiberglass batt (R-11). Neither of these systems now provides the current recommended thermal resistance for exterior walls. No vapor / water barrier exists between the brick and the inside surface and there aren't any drainage weep holes above each ledge support.

Windows exist only on the southeast and south facades, with a small area of glass on the west side aligned with the existing break rooms on third, fourth and fifth levels. The glass is reflective, with the southeast and south expanses of glass providing a mirror to reflect the Capitol Building. The glass on the southeast and south sides aligns with the existing building atrium spaces. The glazed framing system will be replaced.

The best long-term solution to the building envelope issues is replacement with architectural precast concrete panels. An alternative to replacement of the building envelope is to relieve selected masonry joints, tuckpoint, caulk, and apply a breathable water repellent coating to the existing building exterior. This system represents significant savings, but will require proactive maintenance.

6.10.7 Entrances

As the existing parking ramp upper level is structurally unsound (and under the primary option will be removed), the entrances along Grid 9 need to have stairs installed to facilitate their continuing service.

The existing building curtain wall across the back of the dock area does not provide the necessary thermal barrier and infiltration barrier necessary to keep temperatures stabilized along the north side of the building. An additional vestibule with new doors will be installed.

At the northwest corner of the building, a new personnel entrance will be installed.

6.10.8 Lab Area to Offices

The existing first and second level offices will have all interior non-loadbearing walls removed, creating an open office environment. All finishes from ceiling to floor will be removed and replaced. There will be minor modifications required to mechanical and electrical systems. Existing floor toppings will be removed and replaced, to including a system of under floor electrical ducts.

6.10.9 First and Second Floor Existing Office Areas

To open up all space for office functions, remove the separation walls between the existing office areas and the existing lab areas.

6.10.10 Restrooms

None of the restrooms within the building comply with all accessibility requirements. In most cases, entry hallways and entry doors need to be reconfigured to allow access. The necessary numbers of fixture type, shape, and accessibility in all restrooms will be upgraded to meet current requirements (see table in section 6.6.1. of this document). Door hardware and restroom accessories will be upgraded. The occupancy change of the building from lab to office will require addition fixtures on first and second levels. The existing fixture counts on third, fourth, and fifth levels are insufficient. It is recommended that an additional restroom area be located on each level.

The existing fixture-to-plumbing connections require modification. All fixtures should be upgraded with infrared sensing valves and faucets. Piping isolation valves should be added at each level to simplify repairs. Restroom exhaust will be modified.

6.10.11 Janitor's Closets

One additional janitor's closet should be added on second level adjacent to the restroom core area.

6.10.12 Utility Chases

The current electrical shafts in the building concentrate electrical services in one location, limiting the power available to offices and computer usage, and overloading the floor ducting system. Mechanical system upgrades require additional access routes for utilities.

For these and other reasons, new fire-rated utility shafts for mechanical and electrical systems will be added.

6.10.13 Metrology Lab Area Conversion

Conversion of the Metrology Lab area is needed to provide an employee entrance to the building, additional office space, and loading docks with interior storage.

6.10.14 Existing Dock Area

Air infiltration from the Dock Entry into the first level north corridors is a problem. Currently, excessive winter and summer infiltration of outside air causes objectionable space temperature and humidity conditions in these areas. Addition of a wall will create a vestibule area and mitigate air infiltration. Mechanical heating and cooling systems will be installed to temper the air. This will improve indoor comfort from this area up through the fifth floor elevator lobby.

6.10.15 Atrium Spaces

The existing atrium spaces do not meet the fire and smoke control requirements of current codes. Current code restricts the height of atriums to two floors. The openness of these spaces complicates ventilation control and makes sound isolation between floors nearly impossible. Within the existing 'Terrarium,' the plants, earth, a fishpond, and reptiles all contribute to problems with air quality and moisture load in the building. The fountain within the pond creates too much noise when in operation, and as a result is not in operation. The atrium spaces take up large amounts of area that could be utilized for office functions.

During extreme winter conditions, heating is not sufficient to prevent cold space conditions and objectionable downdrafts. During extreme summer conditions, cooling and airflow capacity is not sufficient to maintain desirable space temperature and humidity conditions.

The atrium spaces will be divided into two story spaces that will provide additional usable space while still maintaining open public space.

The atrium perimeter is open, allowing for the free movement of air and noise. In an effort to restrict both of these, open balconies on the third and fifth floor will have curtainwall systems installed.

6.10.16 Third, Fourth, Fifth Floors

Most of the third, fourth, and fifth levels are dedicated to open office design. In order to bring these spaces up to electrical and mechanical standards, ceilings and floors need to be removed and replaced. Third and fourth level mechanical and storage areas on the north side of the east wing can be demolished and converted to office space. Windows will then be added along the north wall on these floors.

6.10.17 Elevators

The existing elevators are all original equipment, 26 years old, and are showing their age. Car operation is shaky, and stops end with a distinct bounce of the cable system. They do not meet current accessibility requirements.

All elevator systems need to be replaced.

6.10.18 Stairs And Railings

The tread dimensions presently do not meet current code requirements. A review with the Iowa Department of Public Safety, Building Code Division, was conducted with respect to the stairs. The result of this meeting is that with additional fire detection equipment, the existing stair treads may remain in service.

Stair handrails do not meet the current code and will be replaced.

6.10.19 Main Lobby Vestibule

Additional glazing will be added to provide an airlock and to create a separate auditorium lobby. This will improve building HVAC, reducing excessive outside air infiltration.

6.10.20 HVAC (See Sketch SK-MECH-001)

The following heating, ventilating, and air conditioning systems (HVAC) recommendations are based on addressing all noted deficiencies including:

- Areas too hot in summer, but some also too hot in winter.
- Areas too cold in winter, but some also too cold in summer.
- Poor air movement occurs in some areas, while excessive air movement occurs in other areas.
- Poor indoor air quality (IAQ) perceptions.
- Excessive sound levels from HVAC systems.

Implementation of changes to the mechanical system to address the conditions noted above will provide mechanical systems consistent with current building codes; ASHRAE standards for IAQ and energy efficiency; and the Iowa Sustainable Design Guide.

- Replace nine of ten existing air handling unit (AHU) systems with all new equipment. One unit will be located on the 5th Level roof, and a second unit will be located on the 2nd Level roof. Each unit will be of a packaged, custom penthouse design and quality.
- Replace all existing variable air volume (VAV) boxes with new series fan-powered variable air volume boxes with hot water coils (FPVAVHW).

6.10.21 Facilities Management Control System (FMCS)

The FMCS is the "brain" that provides:

- Operational controls, thermostats, and humidistats, to sense and control acceptable space conditions.
- Energy efficiency in the utilization of heating and cooling energy sources.
- A means of recording and documenting critical data.

The existing system will be upgraded to accommodate the HVAC work.

6.10.22 Testing, Adjusting, And Balancing (TAB)

These services provide:

- Measurement and balancing of hydronic hot water flows (gpm) from heating pumps, and chilled water flows (gpm) from cooling pumps.
- Measurement and balancing of airflows for air handling units, fans, VAV boxes, supply air diffusers, and return grilles.

This function is critical to the long-term comfort of the building occupants. It is recommended that this service be retained by the State directly.

6.10.23 Commissioning (Cx)

A process and means of Owner verification that strives to insure that the mechanical and related systems are operating in accordance with the original design intent. With reference to the ASHRAE guidelines, Cx is a process that may include several phases of project development, design, construction, and post-construction services. Development of a "Cx Scope" is required before a potential cost may be estimated. Commissioning is outside the scope of this study.

6.10.24 Electrical – Main

The existing switchgear is original equipment and is approaching its design life. The space between equipment and the available egresses out of the room do not meet the National Electrical Code requirements. Installation of new transformers and main power systems are required if the change is not performed as part of the short-term work on the building.

6.10.25 Electrical – Distribution

The existing electrical distribution is concentrated in one location on all floors. This results in the limitation of cubicle and computer power requirements due to space availability. By feeding all the floors from two locations, this opens up more under floor electrical ducts for power distribution.

6.10.26 Lighting

The existing electrical lighting on the floors is manually operated, and does not automatically turn off areas when people are not present. The conference rooms also need to have methods for dimming lighting to allow presentations and visual displays or computer screens to be viewed without impacting people's vision. By adding dimming ballasts for lighting and lighting contactors to automatically turn off sections of lighting, significant energy savings can result, and improvements in occupant comfort will occur.

6.10.27 Phone

The existing phone system distribution is concentrated in one location on all floors. Although currently adequate, space in the electrical floor ducting is limited. This results in cubicle and office phone requirements being hampered due to space availability. Feeding all the floors from two locations will free up more under floor electrical ducts for phone distribution. Adding fiber throughout the building will allow faster computer communications and provide excellent service to building tenants well into the 21st century.

6.10.28 Public Address System

Presently the existing public address (PA) system can only handle emergency announcements. The installation of a modern system is planned.

6.10.29 Low Voltage Systems

A new updated low voltage system will be installed.